has been done has been animated by earnest desire to preserve the finest features of the forest, and through intimate knowledge of its necessities and peculiar conditions." R. MELDOLA.

NOTES.

THE meeting held on Saturday last at the Royal College of Physicians, and reported in the *Times*, was a very satisfactory one. It was attended by delegates from nearly all the institutions which it was proposed, in the report of the late Royal Commission on the Gresham University, should form constituent colleges of the reorganised University of London. Dr. Russell Reynolds, F.R.S., occupied the chair. Since Sir Albert Rollit gave notice in the House of Commons of a motion asking that some action be taken to carry into effect the report of the Royal Commission, there has been ample time for the various institutions involved in the scheme for a Teaching University to deliberate and deliver their opinions on the recommendations. Practically all the constituent schools and colleges have availed themselves of the opportunity, and have, in the main, expressed approval of the proposals. The time has arrived, therefore, at which to set the machinery in action which would lead the Government to appoint a Statutory Commission to frame a scheme on the lines of the report of the late Commission. The necessary motive power is contained in the following resolutions put before Saturday's meeting. It was moved by Prof. Erichsen, the president of University College, and seconded by the Rev. Mr. Whitehouse—"That this meeting of delegates from institutions mentioned in the report of the Royal Commission on the Gresham University desires to express generally its approval of the proposals contained in the report of the Royal Commission, and would urge on the Government that a Statutory Commission be appointed at an early date with power to frame statutes and ordinances in general conformity with the report of the Royal Commission." This resolution was put to the meeting and was carried, the only dissentients being the representatives of King's College. It was also agreed, on the motion of Dr. Norman Moore, "That a copy of this resolution be forwarded to the Lord Chancellor, the Lord President of the Privy Council, the Home Secretary, and the Vice-President of the Council, to be accompanied by a request that they will receive a deputation on the subject, the same to consist of the delegates to this meeting."

PAST and present students of the Mason College, Birmingham, presented Dr. Tilden with a silver bowl and a congratulatory address last week, on his removal to the chair of Chemistry at the Royal College of Science, and as a mark of appreciation of his long and honourable career in connection with the college. The proceedings were of a very enthusiastic character, and Dr. Tilden's students and colleagues vied with each other in expressing their esteem for him as a teacher and an investigator. In the course of his reply, Dr. Tilden remarked that fourteen years ago he went to Birmingham quite a stranger, at a time when there was no science college actually opened. His three colleagues—Profs. Hill, Poynting, and Bridge—were appointed with him as the first four professors of the college, when the building was quite empty. In the first session they had some eighty students between them, and those days were exceedingly happy. Those first professors had unusual privileges and responsibilities. They were naturally given a free hand. They had no traditions to live up to, no standard to go by except that which they themselves set up. They were entrusted with the great duty, the heavy responsibility, of creating their several departments and building up the life of the college, and setting up standards of teaching and conduct which would serve for their successors. Referring to his successor, Dr. Tilden said that, under Prof. Percy Frankland's care, he had no doubt that the work of the college would advance in the right direction.

OUR continental neighbours must often be amused at the forms in which we raise monuments. It will be remembered that a year ago a subscription list was opened for the purpose of erecting a memorial of some kind to Gilbert White. The appeal resulted in £250 being obtained. With this money a hydraulic ram has been fixed at the spring head near the village of Selborne, to force water into a reservoir erected eighty feet above the village. The water runs from the reservoir through pipes laid along the main streets, and tapped at convenient intervals. Selbornites are thus enabled to obtain a supply of water without journeying to the fountain at the spring head, as had previously to be done. This useful and unpretentious memorial is in keeping with Gilbert White's character; nevertheless, it seems to us that the committee having the funds at their disposal should also have taken into consideration the fact that he does not belong to Selborne alone, but to all lovers of nature.

WE learn from the *British Medical Journal* that three further remarkable instances of the success of Prof. Haffkine's system of anticholera inoculation are reported from Calcutta. In the first case, four out of the six members of a family were inoculated last March. The cholera appeared in the neighbourhood lately, and the disease attacked one of the two who had not been inoculated, while the inoculated remained free. In the second case, five members of a family consisting of eleven persons were inoculated in March. The cholera lately attacked one of the six who had not been inoculated. In the third case, six out of a family of nine were inoculated. When the cholera prevailed in the neighbourhood a few days later the disease attacked one of the three not inoculated. It is stated that the Corporation of Madras have passed a resolution inviting Prof. Haffkine to visit that city and introduce his system.

THE Council of the Royal Statistical Society announce that the subject of the essays for the Howard Medal, which will be awarded in 1895 with 20*l*. as heretofore, is as follows:—"Reformatories, and industrial schools of that class, in their relation to the antecedents, crimes, punishments, education after conviction, and training of juvenile offenders: together with the nature and extent of their influence on the diminution or increase of crime generally. These particulars have to be collected and analysed on a statistical basis, both as respects the institutions and agencies, public and private, at home and abroad, for the reclamation of juvenile offenders, and the best means of dealing with them on release. This does not include the industrial and training institutions certified by the Local Government Board under the 25 and 26 Vict. cap. 43." The essays should be sent in on or before June 30, 1895.

THE death is announced of Prof. F. Q. Rodriguez, Professor of Crystallography in the University of Madrid.

DR. JOSEPH COATS has been appointed Professor of Pathology in the University of Glasgow.

MR. L. O. HOWARD has been appointed entomologist to the U.S. Department of Agriculture, in succession to Prof. C. V. Riley.

MR. J. WOLFE BARRY, the engineer of the Tower Bridge, has had the honour of the Companionship of the Bath conferred upon him by the Queen.

PROF. W. ERB, of Heidelberg University, and F. Jolly, of Berlin, representing an influential committee, invite subscriptions for the erection of a monument to the late Dr. Charcot in the Salpêtrière.

THE death is announced of Dr. Louis de Coulon, one of the founders of the Société des Sciences Naturelles de Neuchatel in 1832, and its president for more than half a century from 1836 to 1890, when he became "Président honoraire." Dr. de Coulon was born July 2, 1804, and died June 13, 1894.

A MEDICAL Congress will be held at Calcutta at the end of next December, under the patronage of the Viceroy, and the presidency of Surgeon-Colonel Harvey. The objects of the Congress are "to bring together men from all parts of the Indian Empire, and to discuss medical subjects connected with Indian diseases, and to place on permanent record some of the work which is now lost to science for want of proper publication."

THE seventy-seventh meeting of the Société Helvétique des Sciences Naturelles will take place at Schaffhausen, from July 30 to August 1 inclusive. The Swiss botanical and geological societies will also hold concurrent meetings. Papers intended to be read before the different sections should be in the hands of the Committee before July 15. The President for the year is Prof. J. Meister, and the Secretaries, Dr. J. Nüesch and H. Wanner-Schachenmann.

A NUMBER of papers were read at the meetings of the Museums Association, held in Dublin last week. Mr. F. W. Rudler described the arrangement of a mineral collection, and Mr. G. H. Carpenter read a paper on collections to illustrate the evolution and geographical distribution of animals. Among the subjects dealt with on the concluding day, June 29, were "Classified Cataloguing, as applied to Palæozoic Fossils," by Mr. W. E. Hoyle, and "The Functions of a Botanical Museum," by Prof. T. Johnson.

THE Register for 1893-94 of the Johns Hopkins University of Baltimore has been received. One of the changes we note is that Prof. Newcomb terminated his active duties as Professor of Mathematics and Astronomy at the beginning of this year, the requirements of the Government service having obliged him to do so. The instruction in higher mathematics is now carried on by Profs. Craig and Franklin, and that in astronomy by Drs. Poor and Chessin. In all the departments of the University facilities are afforded for original research. In physics, Prof. Rowland expects all advanced students to devote most of their time to laboratory work and to undertake investigations designed to be of permanent value. Again, the chief instruction in every course of chemistry is that given in the laboratory. Prof. Remsen does not pander to those who merely take up chemistry in order to obtain a degree. "What is desired," he says, "is a certain maturity of mind with reference to the science of chemistry, and an ability to deal with chemical problems intelligently. This condition of mind is reached, if reached at all, by long-continued laboratory training accompanied by careful study of chemical journals and treatises. It may be said that the arrangements of the laboratory are made mainly with reference to those who wish to take up the study of chemistry in a broad way, and that those who want short courses in special branches of chemistry are not advised to come here. It is believed that whatever object the student may have in view, whether he intends to teach or to follow some branch of applied chemistry, the best preparation he can have is a thorough training in the pure science." We have seen few prospectuses in which the aims of study are more clearly defined. It is the same in all the other branches of scientific knowledge fostered at Baltimore; after students have become familiar with the methods of investigation through the study of typical and described material, they are encouraged to undertake original work. No wonder that the Johns Hopkins University is able to keep going journals of mathematics, chemistry, and biology, as well as numerous bulletins, circulars, and memoirs. The training given is just that calculated to produce results worthy of publication.

THE temperature in the shade exceeded 80° in several parts of England and Wales during the three days ending Monday last, and reached 87° at Cambridge on Sunday. Thunderstorms occurred on Sunday night and following days in many parts of Great Britain, accompanied by very heavy rainfall in places. At Jersey 1·1 inch was measured on Monday morning, and 1·7 inch at Stornoway on Tuesday morning. These storms had the effect of cooling the air; the maximum shade temperature in the neighbourhood of London had fallen about 10° on Tuesday compared with that on the previous day.

THE report of the German Meteorological Institute for the year 1893 contains some interesting details of the activity of that office, in addition to the routine work of dealing with observations from nearly 2,000 stations. During the year the important magnetic observatory of Potsdam became affiliated to the central office in Berlin; the very complete observations made there will be included with regular yearly publications. With the co-operation of the Alpine clubs an attempt has been made to reorganise a meteorological station on the Brocken, but hitherto it has not been successful. Fifteen scientific balloon ascents have been made during the year, in which the officials of the Institute have taken part. After the sixth ascent the balloon was exploded by lightning, but this only temporarily interfered with the work, as the Emperor granted funds to continue it. A complete account of the results obtained will be published in a special volume, when the work is discontinued. The introduction of Central European time into Germany has interfered materially with the meteorological work at the stations during the year.

AT the meeting of the Vienna Academy of Sciences on June 14, Dr. J. Hann submitted an investigation on the daily period of wind velocity on the summit of the Sonnblick (3100 metres), based on a careful and laborious calculation and discussion of anemometrical observations for six years, and also on the range on mountain summits generally. The minimum of wind force takes place on the Sonnblick very early, about 8h. or 9h. a.m., and the maximum occurs about 8h. p.m. On the Säntis (2500 metres), the minimum also takes place relatively early, between 10h. and 11h. a.m. But from the accepted theories of the cause of the daily period of wind force on mountain summits, it might be supposed that the minimum would occur in the afternoon. He therefore examined the records for several other stations, and found that in the summer, for altitudes ranging from 1400 to 4300 metres, the mean time of the minimum occurred at noon. He then investigated these facts to see how they fitted in with the assumed causes of the daily range, and as he could not reconcile them, he suggests that the possible explanation of the daily range on mountain peaks may be that the surface of the mountain being much more warmed than free air during the day affects the anemometers. It is assumed, however, that the chief effect is only active for a few hundred metres below the summit, in the morning, and that later it would be interrupted by the wind coming from the valley. If the minimum were due to the great ascending current, it would occur during the afternoon.

AN apparatus for discovering internal flaws in iron and steel is described in *Industries and Iron*. It is electrical, and consists of a small pneumatic tapper worked by the hand, with which the sample of steel or iron is tapped all over. With the tapper is connected a telephone with a microphone interposed in the circuit. One operator is required to apply the tapper, and the other to listen through the telephone to the sounds produced. Both are in electrical communication, and in separate apartments, so that the direct sounds of the taps may not interrupt the listener, whose duty it is to detect flaws. In applying the system, one operator places the telephone to his ear, and while the sounds produced by the taps are normal he does nothing. Directly a false sound, which is distinguishable from the normal sound, is heard, he signals for the spot to be marked, and by this means is able, not only to detect a flaw, but to fix its locality.

THE current number of the Johns Hopkins University (U.S.A.) *Circular* contains a preliminary note, by Edwin F. Northrup, on a new method of obtaining the specific inductive capacity of solids under either slowly or rapidly changing fields. It is of great importance in connection with Maxwell's electromagnetic theory of light that, since the refractive index for most substances has only been measured for very short waves, the specific inductive capacity be measured under such circumstances that the field of force alternates with such rapidity as to produce waves comparable in length to the waves with which the refractive index is determined. The apparatus employed by the author consists of three heavy brass plates, fastened parallel to each other, and separated by about three inches. Each plate is held in position by four insulating strips of ebonite, through the ends of which pass four iron rods with a screw-thread cut upon their whole length. To the centre of each of the two outside plates, and perpendicular to the plate, is fastened a brass tube. A rod, half of which is of ebonite, moves in this tube and carries at its end a thin plane plate of glass, the surface of which is coated with metal foil. These small movable plates are as nearly as possible parallel to the large plates, and their position is given by a vernier attached to the ebonite rods. The two outside plates are connected by a metal rod which carries a metal ball. Another ball, nearly opposite the first, is fixed by a short metal pin to the middle plate so that the distance between the balls can be adjusted. In employing the apparatus to measure specific inductive capacity with rapidly varying fields, the following arrangement is used. The two outside plates and one terminal of a large induction coil being connected to earth, the other terminal of the coil is connected to the middle plate. When the coil works, sparks pass between the balls, and oscillations are set up. The lines of force, when air only is the dielectric, divide evenly between the plates, and in the region of the small plates the field may be considered as uniform; hence if these plates are at equal distances from the centre plate, they will always remain at the same potential. If, however, a plate of some other dielectric is placed between the centre plate and one of the movable plates, in order that the two small plates may remain at the same potential, they will have to be placed at unequal distances from the centre plate, and from their relative positions the specific inductive capacity can be deduced. In order to "weed" out the effects of the slow changes of potential due to the charge and discharge of the coil, the two small plates are connected to the primary of a small transformer, the secondary of which contains a spark-gap. In this way the effects due to the slow changes are eliminated, since the rate of variation of the induction in the transformer, due to these slow changes, is not sufficient to raise the potential in the secondary to the 300 volts or more required to break down the dielectric in the spark-gap.

STUDIES of the eastern Yucca Moth (*Pronuba yuccasella*) and its importance in Yucca pollination, have, from time to time, been recorded in reports of the Missouri Botanical Garden. In a recent report, Mr. J. C. Whitten describes observations which complete the knowledge of the life-history of this interesting insect. The observations refer to the time when the larva ceases feeding in the capsule, until it is encased in its underground cocoon, when, the following spring, it is to change to the pupa state. It was found that the larvæ made their escape from the capsules of *Yucca filamentosa*, and entered the soil during rainy weather, when the ground was softened, and consequently easily penetrable. They did this either during the daytime or at night, and not exclusively toward the end of the night, as Prof. Riley had predicted. The larvæ descended to the ground both by use of a thread and by crawling.

A CATALOGUE of works on entomology, being No. 26 of *Bibliotheca Entomologica*, has been issued by Herr Felix L. Dames, Berlin, Koch-Strasse 3.

WE have received from the Revenue and Agricultural Department of the Government of India a copy of the Returns of Agricultural Statistics of British India and the Native State of Mysore for 1892–93.

THE May number of the *Journal* of the Jersey Biological Station (*Jour. of Mar. Zool. and Micros.*, edited by James Hornell, vol. i. No. 3, 1894) contains several original contributions by the editor, in one of which is given an interesting account of the variability of the opercular filaments in *Serpula pectinata*. Elementary and picturesque descriptions are also given of the metamorphoses of the Crustacea *Squilla desmarestii* and *Scyllarus arctus*, and of the structure of anemones. The number is illustrated by several autographic plates and woodcuts, and contains a frontispiece giving a photographic view of the aquarium of the laboratory, which would seem, from the editorial report, to be making well-merited progress.

THE special articles, official reports, notes, communications, and reviews in part ii. of vol. v. of the *Journal* of the Royal Agricultural Society, issued on June 30, make up a number replete with information. The first two meetings of the Society—Oxford 1839 and Cambridge 1840—are described by Mr. Ernest Clarke. Profs. J. McFadyean and G. T. Brown write on the prevalence of anthrax in Great Britain, Mr. Joseph Darby on irrigation and the storage of water for agricultural purposes, and Dr. Fream on some minor rural industries. Among the official reports, we note one by Dr. J. A. Voelcker on aubury, club-root, or finger-and-toe, in turnips. Dr. J. M. H. Munro writes on sewage disposal and river pollution, and Lord Egerton of Tatton describes the Tewfikieh College of Agriculture, Egypt.

THE makers of a very neat little camera, Messrs. R. and J. Beck, have just send us a copy of the "Frena Handbook," in which the inventor says practically all there can be said with regard to the description, method of use, manipulation, &c., connected with this instrument. For the benefit of "some future philologist" who may at some time be in doubt as to the derivation of the word "Frena," an etymological note informs us that it is derived from "faro" and "crena," the former being the name of the well-known game of cards, and the latter meaning a notch; the instrument automatically discharging one film after another like a *faro-box*, and doing this by means of notches. In this camera notched films are used, being thin and stiff sheets of transparent cellulose film, and as many as forty can be carried in the holder at the same time. With regard to some of the technical data of the No. 2, quarter-plate, size, the lens is an "autograph" rapid rectilinear of focal length 5½ inches, normal aperture F–11, and covers a 3 × 4¼ inch film; the dimensions of the case are 11¼ × 5½ × 4½ inches, and when filled with forty films the apparatus weighs four pounds. Among many of the advantages of this camera may be mentioned the arrangement by which the films may be tilted, thus providing a neat and easily worked form of swing-back. After the introduction, the author of this handbook gives a very brief and concise summary of the outline of operations necessary for the veriest beginner, printing them in red ink. This, however, is supplemented with fuller details by a series of extensive notes on the use of the "Frena," occupying nearly eight times as many pages as the "outlines" above mentioned. These notes contain some sound advice, of which the novice could not do better than take advantage, and they are written in a clear style. The illustrations and figures are exceedingly neat and clear, and the whole get-up of the book is all that can be desired.

SOME new facts concerning the nature of the molecule of calomel are contributed to the current issue of the *Berichte* by Prof. Victor Meyer and Mr. Harris. The determinations of the vapour density of mercurous chloride made by Mitscherlich, Deville and Troost, and Rieth, in each case afforded numbers in close agreement with those demanded by the simple formula HgCl. Odling, however, disputed the possibility of the existence of molecules containing only one atom of each element, involving the assumption of univalency for mercury, and showed that when gold-leaf is immersed in the vapour it becomes amalgamated, indicating the presence of free mercury vapour. Erlenmeyer subsequently showed that this experiment was open to the objection that the amalgamation might be due to a chemical reaction between gold and calomel vapour, and pointed out that the presence of free mercury may be more conclusively shown by immersing a glass tube, cooled by containing a column of quicksilver, in the vapourised calomel, when an abundant condensation of mercury globules is observed. Debray afterwards immersed in the vapour of calomel a bent tube of silver, gilded outside and kept cool by the passage of a current of cold water, and found that both mercury and corrosive sublimate were condensed upon it, but that the greater portion of the sublimate consisted of unchanged calomel. Debray therefore concluded that dissociation into mercury and corrosive sublimate only occurred to an insignificant extent. Prof. Meyer and Mr. Harris now show that if a piece of gold-leaf is immersed for an instant only in the vapour of calomel it is invariably amalgamated, but if it is allowed to remain in the vapour for a few minutes it becomes pure gold again, the mercury being volatilised. They have further carried out a series of vapour density determinations by Prof. Meyer's well-known method, at the temperature of the vapours of boiling sulphur (448°) and phosphorus pentasulphide (518°). The numbers obtained are all in close proximity to that calculated for the molecular condition HgCl, agreeing in this respect with the older determinations above referred to, in which other methods were employed. The calomel was introduced into the apparatus in the form of a compressed pastille, thus obviating the necessity for a containing bulb or tube, and enabling almost instantaneous volatilisation to be achieved. A second series of experiments were then made with a mixture in the proper proportions of free mercury and corrosive sublimate, and the results were almost identical with those obtained from calomel. Of course this does not afford any conclusive evidence, but experiments are next described in which an attempt at identification of the substance or substances present in the vapour was made. It was shown that when the cylindrical bulb of the density apparatus was constructed of porous earthenware, a very large amount of mercury vapour diffused through it, and could be condensed upon an outer enveloping glass cylinder. Further, that when calomel is vapourised in a retort connected with a Sprengel pump, and in which the pressure has been reduced by the latter to about 30 mm., the upper portion of the apparatus becomes covered with a layer of mercury globules, and a proportionate quantity of mercuric chloride is formed. Chemical evidence is also adduced to prove the presence of mercuric chloride vapour in the gaseous product of heated calomel, for it is shown that pieces of caustic potash previously heated to the same temperature become instantly covered with orange-coloured mercuric oxide, just as when plunged into vapour of corrosive sublimate, proving the absence of any large quantities of mercurous chloride, which would have afforded a black deposit of mercurous oxide. Prof. Meyer and Mr. Harris therefore conclude that when calomel is vapourised it dissociates into mercury and corrosive sublimate, $Hg_2Cl_2 = Hg + HgCl_2$, and the necessity for the assumption of monadic valency for mercury is thus avoided.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♂) from India, presented by Mrs. McHugh; three Barbary Turtle Doves (*Turtur risorius*) from North Africa, presented by the Misses E. and P. Mackenzie; a Common Cuckoo (*Cuculus canorus*), British, presented by Mr. W. Keen; two Horned Lizards (*Phrynosoma cornutum*) from Texas, presented by Miss Maitland, an Anomalous Snake (*Coronella anomala*) from South Africa, deposited; an Ostrich (*Struthio camelus*, ♀), from Africa, two Red-headed Merlins (*Hypotriorchis chicquera*) from India, purchased; an Æthiopian Wart Hog (*Phacochærus æthiopicus*, ♀), from South-East Africa, received in exchange; a Thar (*Capra jemlaica*, ♂). a Burrhel Wild Sheep (*Ovis burrhel*), a Great Kangaroo (*Macropus giganteus*, ♀), born in the Gardens.

PROF. W. R. FISHER requests us to make the following correction in his contribution to our last number:—On p. 193, line 8 from top, for "1·025" read "$1{\cdot}025^{45}$."

OUR ASTRONOMICAL COLUMN.

THE FIRST OBSERVATION OF SUN-SPOTS.—A contribution to the history of the rival claims of the various alleged discoverers of sun-spots appears in the *Rendiconti dei Lincei*, from the pen of Prof. E. Millesovich. It is a criticism of Dr. Berthold's pamphlet on "Master Joann Fabricius and the Sun-spots," setting forth the claims of the son of the Frisian astrologer David Fabricius to the name of the true discoverer of the solar phenomenon in question. The other claimants are, of course, Galileo and the Jesuit Scheiner, known under the name of Apelles. The claims of Fabricius are based upon his book *De Maculis in Sole observatis, narratio*, &c., published at Wittenberg in 1611. He had been studying at Leyden University, whence he brought home Lippershey's newly-invented telescope to his father at Osteel. The latter was already well known among astronomers as the discoverer of the variability of Mira Ceti. The method of projecting the solar image on a screen is set forth in detail in the work referred to, as well as the correct conclusion that the sun rotates about an axis. Prof. Millesovich grants that the name of Fabricius was probably known to the Jesuits and suppressed as that of a heretic, but he comes to the conclusion that Galileo was actually the first discoverer, having observed the spots as early as the summer of 1610, whereas Fabricius saw them independently on March 9, 1611, and Scheiner about the same time, without, however, paying much attention to them before the publication of Fabricius's *Narratio*. He then observed them assiduously, and collected a large number of valuable records.

THE PROGRESS OF ASTRONOMICAL PHOTOGRAPHY.—Under this title, Mr. H. C. Russell, C.M.G., F.R.S., the Government Astronomer at Sydney, delivered an address, as President of Section A (Astronomy, Mathematics, and Physics), at the last meeting of the Australasian Association for the Advancement of Science. The address has now been issued, and it is the most complete statement that we have seen of the advance of astronomical photography from the time when Prof. J. W. Draper took daguerreotypes of the moon, in 1840, to June 1893. The references distributed through the address add to its usefulness. Reference is made to eighty-one sources of information in all, and of these, NATURE claims the large proportion of thirty-two. Like many other enthusiastic workers in the realm of celestial photography, Mr. Russell believes that astronomical observations will eventually be automatically made by means of the sensitive plate of the photographer.